MPA- Networks

Self-Assessment Checklist Criteria

Ecological Design Criteria

Exercise 1

Sunday May 17th, 2009

Ecological Design Criteria

CRITERIA

Representativeness

CONCEPT

All ecosystems and habitats (and their biodiversity) within the region are represented in the MPA network.

Oceanographic conditions, bathymetry, geology and cultural or heritage values (including iconic and spiritual areas), should be also considered.

EXAMPLE

Mesoamerican Reef (MAR)Program

Scientists and planners performed a region-wide rapid reef assessment of MAR to identify priority conservation sites, based on the geographic distribution of ecologically significant areas, such as nurseries or feeding areas, that are functionally linked to reefs by physical and ecological processes.

Ecological Design Criteria

CRITERIA

Replication

CONCEPT

MPA networks should include replicates of each representative habitat within the biogeographic region. Replication provides safeguard against unexpected habitat loss or population collapse.

EXAMPLE

Great Barrier Reef Marine Park

Replication is one of the biophysical operational principles to help achieve ecological objectives of representative areas.

Replicate: Have sufficient no-take areas to ensure against negative impacts on some parts of the bioregion.

Ecological Design Criteria

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Viability

CONCEPT

MPA networks should incorporate self-sustaining, geographically dispersed component sites of sufficient extent to ensure population persistence through natural cycles of variation. These sites should be independent (as far as possible) of activities in surrounding areas.

EXAMPLE

Kimbe Bay Marine Protected Area Network (PNG)

MARXAN analysis identified priority Areas of Interest (AOI) for inclusion in the MPA network. AOI boundaries were modified to ensure that biological, socioeconomic, and cultural interests were taken into account. The outcome was the scientific design ensured viability of the MPA network for Kimbe Bay.

Ecological Design Criteria

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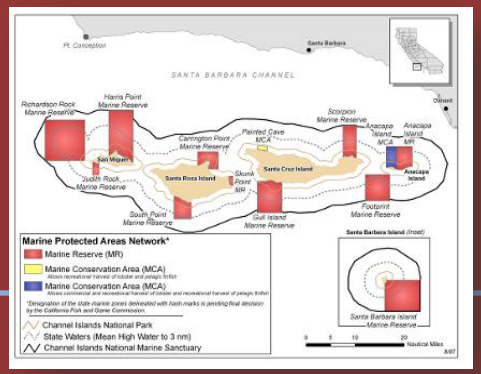
Precautionary Design

CONCEPT

Network designers should base their decisions on the best information available, rather than delaying the process to wait for more and/or better information.

EXAMPLE



Channel Islands, California MPA Network

In the absence of data on many of the ecological criteria, reserve networks were identified and successfully implemented, demonstrating a precautionary approach taken for the reserve placement.

Ecological Design Criteria

CRITERIA

Permanence

CONCEPT

Network design must provide long-term protection to effectively conserve diversity and replenish resources.

KEY ASPECTS

- Independently of the network goals, having long-term, permanent, no-take closures, provides the greatest level of ecological protection and benefits.
- The maintenance of larger, older, longer-living fish will allow increased egg production.
- For protecting highly migratory species, “bottlenecks” or areas with certain oceanographic features related to key behaviors (feeding, breeding, and socializing) should be protected both spatially and temporally.
- Adaptive periodic closures may be a more viable conservation strategy in some cases (e.g., socioeconomic issues); however, they will not be as effective as permanent closures and may incur more management costs.

Ecological Design Criteria

CRITERIA

Connectivity

CONCEPT

MPA network design should seek to maximize and enhance the linkages among individual MPAs, groups of MPAs within a given eco-region, or networks in the same and/or different regions.

EXAMPLE

California Statewide MPA Network

The California Marine Life Protection Act (MLPA) has an explicit goal of ensuring that MPAs function, to the extent possible, as a network. The MLPA size and spacing guidelines are based on the best available scientific data on the patterns of adult movement and larval dispersal of species likely to benefit from MPAs; patterns of movement or dispersal vary broadly from a few meters to hundreds of kilometers for species found along the California coast.

Ecological Design Criteria

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Resilience

CONCEPT

MPA networks must be designed to maintain ecosystems' natural states and to absorb shocks, particularly in the face of large-scale and long-term changes (such as climate change). The term resilience incorporates the capacity of socio-ecological systems to cope with, adapt to, shape change and learn to live with uncertainty and surprise.

EXAMPLE

Cousin Island MPA in the Seychelles

During a coral bleaching evetn, this area exhibited a dramatic phase shift from coral to macroalgal dominance, accompanied by a collapse in reef structure. This occured despite the full protection of herbivorous fish in the well managed MPA. The lack of resilience in Cousin MPA suggests that individual, small-scale protected areas may not be successful on their own if inappropriately sized or placed, even when well-managed.

Ecological Design Criteria

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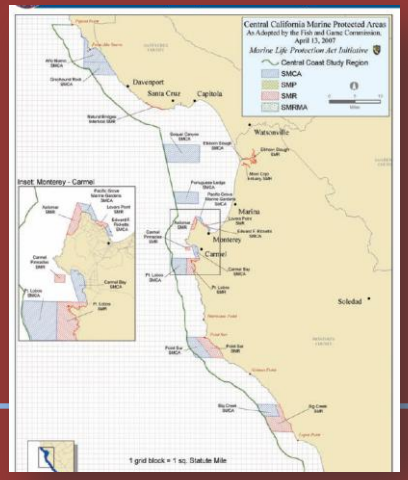
Size and Shape

CONCEPT

The size, shape and spacing of the MPAs in the network greatly influence the connectivity in the network, the degree to which there are edge effects, and the ease of enforcement of the MPAs.

EXAMPLE



The California Marine Life Protection Act (MLPA)

The MLPA science guidelines consider size and spacing of MPAs to promote ecological connectivity. The size and spacing guidelines are considered to ensure that MPAs are large enough to protect adults of species that move short to moderate distances, and to allow for self-seeding of short-distance dispersers. The MPAs should be spaced to ensure that larvae from as many species as possible can reach other MPAs with appropriate habitat.

Best Practices for Planning and Implementing MPA Networks

CRITERIA

Integrated Management Framework

CONCEPT

MPA networks can only be effective at curbing the decline of ocean health and reducing threats if they are implemented within larger frameworks of ecosystem based management, integrated ocean governance and coastal management.

Example: Philippines

Scaling up to networks of MPAs in the Philippines is demonstrating the importance of including an ICM regime for effective implementation.

ICM in this case is addressing fisheries management, providing an opportunity to better address stressors occurring outside of MPAs. All levels of government and the private sectors are engaged in a coordinated approach to management.